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IS 13659 (1993): Polyglycerol Esters of Interesterified Ricinoleic Acid, Food Grade [FAD 8: Food Additives]

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Indian Standard

POLYGLYCEROL ESTERS OF INTERESTERIFIED RICINOLEIC ACID, FOOD GRADE — SPECIFICATION

UDC 664·099·6 : 547·475·124

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

March 1993 Price Group 1

AMENDMENT NO. 1 APRIL 2006
TO
IS 13659 : 1993 POLYGLYCEROL ESTERS OF INTERESTERIFIED RICINOLEIC ACID, FOOD GRADE — SPECIFICATION

(*Page* 1, *clause* 2) — Substitute '1699 : 1995 Methods of sampling and test for food colours (*second revision*)' *for* '1699 : 1974 Methods of sampling and test for food colours (*first revision*)'.

(*Page* 1, *clause* 3.2.4, *line* 5) — Substitute 'isopropanol : water, 90 : 10 (*v/v*)' *for* 'isopropanol : water 90 : 1 (*v/v*)'.

[*Page* 2, *Table* 1, *Sl No.* (v), *col* 4] — Substitute 'Cl 15 of IS 1699 : 1995' *for* 'Cl 10 of IS 1699 : 1974'.

[*Page* 2, *Table* 1, *Sl No.* (vi), *col* 2] — Substitute 'Heavy metals, mg/kg, *Max*' *for* 'Lead (as Pb), mg/kg, *Max*'.

[*Page* 2, *Table* 1, *Sl No.* (vi), *col* 4] — Substitute 'Cl 16 of IS 1699 : 1995' *for* 'Cl 9 of IS 1699 : 1974'.

[*Page* 2, *Table* 1, *Sl No.* (vii), *col* 4] — Substitute 'Cl 15 of IS 1699 : 1995' *for* 'Cl 11 of IS 1699 : 1974'.

(*Page* 2, *clause* 5.1, *line* 5) — Substitute '4 of IS 1699 : 1995' *for* '3 of IS 1699 : 1974'.

(FAD 8)

Reprography Unit, BIS, New Delhi, India

Food Additives Sectional Committee, FAD 8

FOREWORD

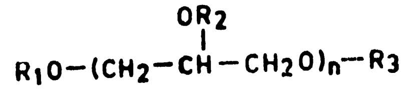
This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Food Additives Sectional Committee had been approved by the Food and Agriculture Division Council.

With the increased production of processed foods, manufacturers have started adding a large number of substances, generally in small quantities, to improve the appearance, flavour, texture or storage properties and in some cases to enhance the nutritive values of the processed food. As certain impurities in these substances have been found to be harmful, it is necessary to have strict quality control of these food additives. A series of standards is, therefore, being prepared by the Institution to cover purity and identification of these substances. These standards would help in checking purity which requires to be checked at the stage of manufacture, for it is extremely difficult (and in many cases impossible) to detect the impurity once these substances have been added to the processed foods. Besides, these standards are intended to guide the indigenous manufacturers in making their product conform to specifications that are accepted by scientists, health authorities and international bodies.

Polyglycerol esters of interesterified ricinoleic acids also known as glyceran ester of condensed castor oil fatty acids and polyglycerol esters of polycondensed fatty acids from castor oil. These are prepared by the esterification of polyglycerol with condensed castor oil fatty acids.

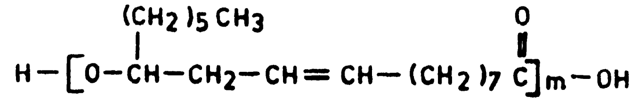
Polyglycerol esters of interesterified ricinoleic acids are being permitted for use as release agents in bakery industry and in chocolate manufacture.

The major components have the following general structure.



$$R_1O-(CH_2-\overset{OR_2}{\overset{|}{CH}}-CH_2O)_n-R_3$$

where the average value of 'n' is about 3 and R_1, R_2 and R_3 each may be hydrogen or a linear condensation polymer of ricinoleic acid with itself as follows:



$$H-[O-\overset{(CH_2)_5CH_3}{\overset{|}{CH}}-CH_2-CH=CH-(CH_2)_7\overset{O}{\overset{\|}{C}}]_m-OH$$

where the average value of 'm' is between 5 and 8.

In the preparation of this standard the consideration has been given to the provisions of the *Prevention of Food Adulteration Act, 1954* and the *Rules* framed thereunder and the *Standards of Weights and Measures (Packaged Commodities) Rules, 1977*. However, this standard is subject to the restrictions imposed under these Acts wherever applicable.

Considerable assistance has been derived from FAO Food and Nutrition Papers No. 4 'Specification for identity and purity of thickening agents, anticaking agents, antimicrobials, antioxidants and emulsifiers' published by the Joint FAO/WHO Expert Committee on Food Additives, Rome 1978.

The EEC Directive on the product which is in the draft stage has also been given due consideration and the requirements of this standard are aligned with the draft EEC Directives.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

POLYGLYCEROL ESTERS OF INTERESTERIFIED RICINOLEIC ACID, FOOD GRADE — SPECIFICATION

1 SCOPE

This standard prescribes the requirements and methods of sampling and test for polyglycerol esters of interesterified ricinoleic acid.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
548 (Part 1) : 1964	Methods of sampling and test for oils and fats: Part 1 Sampling, physical and chemical tests (*revised*)
1070 ; 1992	Reagent grade water (*third revision*)
1699 : 1974	Methods of sampling and test for food colours (*first revision*)
6854 : 1973	Methods of sampling and test for ingredients used in media for microbiological work
13658 : 1992	Polyglycerol esters of fatty acids, food grade — Specification.

3 REQUIREMENTS

3.1 Description

Polyglycerol esters of interesterified ricinoleic acids are highly viscous liquids, yellowish to brown in colour and with a typical fat-related odour.

3.2 Identification Tests

3.2.1 *Solubility*

Insoluble in water and in ethanol; soluble in ether, hydrocarbons and halogenated hydrocarbons.

3.2.2 The product shall give a positive test for fatty acids when determined by the method of test given in Annex A.

3.2.3 *Test for Ricinoleic Acid*

The fatty acids liberated (*see* 3.2.2) shall have a hydroxyl value corresponding to that for castor oil fatty acids (about 150 to 170) when tested by the method given in **16** of IS 548 (Part 1) : 1964.

3.2.4 Spot 5 to 20 μl of the aqueous layer obtained in **A-1.1.1** alongside control spots of glycerol on paper such a Whatman No. 3 and develop using descending chromatography for 36 hours with isopropanol: water 90 : 1 (*v*/*v*). The glycerol spot moves 40 cm and the polyglycerols are revealed in succession below that for glycerol when the paper is sprayed with either permanganate in acetone or ammoniacal silver nitrate.

3.3 Purity Tests

3.3.1 *Polyglycerols*

The polyglycerol moiety shall be composed of not less than 75 percent of di-tri and tetraglycerols and shall contain not more than 10 percent of polyglycerols equal to or higher than heptaglycerol when tested by the method given in Annex C of IS 13658 : 1992.

3.3.2 The materials shall also conform to the requirements given in Table 1.

4 PACKING, STORAGE AND MARKING

4.1 Packing

The material shall be securely packed in well-filled containers with minimum access to light and moisture. The containers shall be such as to preclude contamination of the contents with metal or other impurities.

4.2 Storage

The material shall be stored in a cool and dry place so as to avoid excessive exposure to heat.

4.3 Marking

Each container shall be legibly marked to give the following information:

a) Name of the material including the words, 'food grade';
b) Source of manufacture;
c) Minimum net mass of the contents;
d) Batch or code number;
e) Date of manufacture; and
f) Any other details required as per the *Standards of Weights and Measures (Packaged Commodities) Rules, 1977*/*Prevention of Food Adulteration Rules, 1955.*

Table 1 Requirements for Polyglycerol Esters of Interesterified Ricinoleic Acid, Food Grade
(*Clause* 3.3.2)

Sl No.	Characteristics	Requirements	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Hydroxyl value	80-100	Cl 16 of IS 548 (Part 1) : 1964
ii)	Refractive index	1·4630 to 1·4665	Cl 10 of IS 548 (Part 1) : 1964
iii)	Acid value, *Max* (mg KOH per g)	6	Cl 7 of IS 548 (Part 1) : 1964
iv)	Iodine value, Wijs	72-103	Cl 14 of IS 548 (Part 1) : 1964
v)	Arsenic (as As), mg/kg, *Max*	3	Cl 10 of IS 1699 : 1974
vi)	Lead (as Pb), mg/kg, *Max*	10	Cl 9 of IS 1699 : 1974
vii)	Copper and Zinc, mg/kg, *Max*	50	Cl 11 of IS 1699 : 1974
viii)	Zinc, mg/kg, *Max*	25	Cl 18 of IS 6854 : 1973

4.3.1 Each container may also be marked with the Standard Mark.

5 SAMPLING

5.1 Representative samples of the material shall be drawn and conformity of the material to the requirements of this specification shall be determined according to the procedure prescribed in 3 of IS 1699 : 1974.

6 TESTS

6.1 Tests shall be carried out by the method as specified in 3.2, 3.3 and col 4 of Table 1.

6.2 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070 : 1992) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the test results.

ANNEX A

(*Clauses* 3.2.2 *and* 3.2.4)

TEST FOR FATTY ACIDS

A-1 PROCEDURE

A-1.1 Reflux 1 g of sample with 15 ml of 0·5 N ethanolic potassium hydroxide for 1 hour. Add 15 ml of water, acidify with about 6 ml of dilute hydrochloric acid. Oily drops or a white to yellowish white solid is produced which is soluble in 5 ml of hexane.

A-1.1.1 Remove the hexane layer. Extract again with 5 ml of hexane and again remove the hexane layer. Use the aqueous layer for detection of acids other than fatty acids.

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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